

# Journal of the Royal Society of Arts

NO. 4947

FRIDAY, 18TH MARCH, 1955

VOL. CIII

## DEATH OF MR. JOHN ALEXANDER MILNE



*The Society's portrait of Mr. Milne by T. C. Dugdale, R.A.*

Fellows will have learned with very great regret that John Alexander Milne, a Vice-President of the Society, and a former Chairman of Council, died on Saturday, the 5th March, in his 83rd year.

Born in 1872 (his father was a Senior Chaplain to H.M. Forces), he was educated in Dublin and qualified as a doctor. He practised medicine for a while and then became associated over fifty years ago with Lewis Stone, the son of Henry Stone of Banbury, furniture maker and fine colour printer. He greatly assisted in the development of this old family business of Henry Stone & Son, Ltd., and became Chairman and Managing Director—posts which he held at his death. Through him, Stone's of Banbury enjoy a reputation to-day not only for good contemporary furniture, but also for some of the finest colour printing in the world.

During the First World War, after serving for a short while in the R.N.V.R., Milne became a member of the War Trade Department and Chairman of the Linen and Silk Committee. For three years he assisted the Government on these and other committees, and there met Sir Frank Warner, who was doing similar voluntary work. Together they paid visits to Paris and Lyons in connection with this work, and struck up a lasting friendship. For his war work, Milne received the C.B.E. in 1918.

Milne became a Fellow of the Society in 1923 and soon interested himself in his friend's work for the annual Competition of Industrial Designs. These competitions were carried on successfully for ten years, until 1933; they were revived in a new form, as the present Industrial Art Bursaries Competitions, in 1946. Sir Frank died in 1930, and in 1932 Milne, who had then recently been elected to the Council of the Society, was elected Chairman. This election marked a point in the long history of the Society. It meant that the cause of industrial art and design was to remain and be developed as a primary objective of the Society.

Milne then unfolded his plan for the great Exhibition of British Art in Industry, which was opened in 1935 by the Prince of Wales; it was held at Burlington House itself, in association with the Royal Academy. In this collaboration the Academy was recognizing the importance of industrial design as a branch of art. While many criticized the Exhibition at the time, it has come to be recognized as a milestone in the promotion of the cause of good design and was undoubtedly a factor in the decision of the Government to set up the Council for Art and Industry, of which the present Council of Industrial Design is the post-war successor.

Another great achievement in this sphere was also Milne's idea—an idea very close to his heart—namely the establishment in 1936 of a new and high distinction to be conferred on industrial designers. This Distinction, as Fellows will remember, is known in full as 'Designer for Industry of the Royal Society of Arts', and entitles the recipient, with Royal approval, to use the letters 'R.D.I.' after his name. It was created in order to give to the industrial designer the same recognition as the Royal Academy gives to the artist. The Distinction is now regarded as the highest honour to which a designer can attain.

For his great work in the cause of good design, Milne was awarded the Albert Medal in 1940 'for services to Industrial Art and in the promotion of the Exhibition of British Art in Industry and the establishment of the R.D.I. Distinction'. He also had the rare honour of being elected Chairman of Council for three years running, the Bye-Laws of the Society having to be altered for the purpose; and in 1938 he was elected an Honorary Life Fellow. He remained a valued member of Council until his death, and for many years had been one of the four nominees of the Royal President. He marked its Bicentenary last year by presenting to the Society a Chairman's Badge of Office; this beautiful piece of work in gold and enamel was an example of his enlightened patronage as well as of his constant generosity to the Society.

Milne's interests were many and varied. He lived for many years before the First World War and in the 1930s and 1940s in Berkshire. He had served on the County Council, was a J.P. in that county, and enjoyed his seat on the Ascot Bench until age forced his retirement. His early training made him a valued Chairman of the Golden Square Throat, Nose and Ear Hospital until the hospital became nationalised under the Health Service.

His association with Sir Frank Warner led to his representing Warner's Trustees on the Board of Warner & Sons, Limited, for just a quarter of a century; here too, and as Chairman for as many years of the Medici Society Limited, and as President of the British Colour Council from 1934 to 1944, he was able to further the cause of good design. Only a fortnight ago he was elected an Honorary Fellow of the Incorporated Institute of British Decorators and Interior Designers.

Milne was President of the Senior Golfers' Society and played regularly until a few years ago.

He had many friends in many walks of life. This is not surprising because he was above all courteous and friendly. But he would not compromise with the truth and occasionally preferred some loss of popularity for a while rather than to sacrifice what he deemed to be the correct. Uncannily his sagacity and sound cautious judgment were so often proved right by subsequent events.

His passing severs another of the diminishing number of links with the gracious days of fifty years ago and those of us who admired him and held him in warm esteem will miss him for a long time.

E. W. G.

#### MEMORIAL SERVICE

A Memorial Service will be held in the Church of St. Martin-in-the-Fields, at 11.30 a.m. on Tuesday, 29th March.

#### FORTHCOMING MEETINGS

MONDAY, 21ST MARCH, at 6 p.m. The second of three CANTOR LECTURES on '*The Mechanical Properties of Metals*', entitled '*Creep*', by Professor E. N. da C.

Andrade, D.Sc., Ph.D., LL.D., F.R.S. (The lecture will be illustrated with lantern slides.)

WEDNESDAY, 23RD MARCH, at 2.30 p.m. 'Radio Astronomy', by A. C. B. Lovell, O.B.E., Ph.D., F.Inst.P., F.R.A.S., Professor of Radio Astronomy, University of Manchester and Director of Jodrell Bank Experimental Station. Sir Ben Lockspeiser, K.C.B., F.R.S., Secretary, Department of Scientific and Industrial Research, will preside. (The paper will be illustrated with films and lantern slides.)

THURSDAY, 24TH MARCH, at 5.15 p.m. COMMONWEALTH SECTION. 'Post-war Changes in Africa', by the Right Honble. Lord Hailey, P.C., G.C.S.I., G.C.M.G., G.C.I.E. The Right Honble. Lord Milverton, G.C.M.G., will preside. (Tea will be served from 4.30 p.m.)

MONDAY, 28TH MARCH, at 6 p.m. The last of three CANTOR LECTURES on 'The Mechanical Properties of Metals', entitled 'Fatigue', by Major P. L. Teed, A.R.S.M., F.R.Ae.S., F.I.M., Deputy Chief of Research and Development, Messrs. Vickers-Armstrongs, Ltd. (The lecture will be illustrated with lantern slides.)

WEDNESDAY, 30TH MARCH, at 2.30 p.m. 'Recent Developments in Deep Sea Diving', by Sir Robert H. Davis, D.Sc., Chairman, Messrs. Siebe, Gorman & Co., Ltd., Captain W. O. Shelford, R.N. (ret.), late Superintendent of Diving, H.M. Royal Navy, will preside.

WEDNESDAY, 27TH APRIL, at 2.30 p.m. 'The Detection and Prevention of Anti-Social Behaviour in Young Persons', by Sir Basil Henriques, C.B.E., M.A., J.P., Chairman of East London Juvenile Court.

THURSDAY, 28TH APRIL, at 5.15 p.m. COMMONWEALTH SECTION. 'The Commonwealth as a Source of Essential Oils', by M. F. Carroll, M.Sc., F.R.I.C., Chief Research Chemist, Messrs. A. Boake, Roberts & Co., Ltd. Sir John Simonsen, D.Sc., F.R.I.C., F.R.S., a Member of Council of the Society, will preside. (Tea will be served from 4.30 p.m.)

*Fellows are entitled to attend any of the above meetings without tickets and may also bring two guests. When they cannot accompany their guests, Fellows may give them special passes, books of which can be obtained on application to the Secretary.*

### THE ALBERT MEDAL

The Council are now considering the award of the Albert Medal of the Royal Society of Arts for 1955. They therefore invite Fellows of the Society to forward to the Secretary, by 15th April, the names of such men of high distinction as they may think worthy of this honour. The medal was struck to reward 'distinguished merit in promoting Arts, Manufactures and Commerce'. A list of previous recipients appeared in the last issue of the *Journal*.

# THE RECONSTRUCTION OF THE DUTCH RAILWAYS

*A paper by*

IR. F. Q. DEN HOLLANDER,

*President of the Netherlands Railways, read to the  
Society on Wednesday, 2nd February, 1955, with  
His Excellency D. U. Stikker, G.B.E., The  
Netherlands Ambassador, in the Chair*

THE CHAIRMAN: It is an honour and a pleasure to me that I have been asked to-day to be in the Chair to introduce my very good friend Mr. den Hollander, who is now President of the Netherlands Railways and with whom I share many unforgettable memories of the war.

Mr. den Hollander is not a stranger to London, and I am sure that in the future he is going to be even less so as he has become Adviser to the Transport Commission. I cannot conceal that I feel some pride that this honour has been bestowed on a confederate. Mr. den Hollander gained his first experience in the Far East, in what at that time was called the Netherlands East Indies, where he started his career as a young railway administrator, and in that fast developing country he learned the importance of transport; but, I think in about 1938, Mr. den Hollander stopped hauling tobacco and rubber to the east ports of Sumatra and returned to the Netherlands. When he came back to Holland he played a dominant role in the arms industry in Holland when he became President of the artillery factories near Amsterdam, where he remained until the enemy took over.

After the war, Mr. den Hollander was for some time Secretary-General of the Ministry of Economic Affairs, he then became one of the Managing Directors of the Netherlands Railways and now he is its President.

Mr. den Hollander is going to talk to us about the reconstruction of the Dutch railways, and if it is correct, as many people say, that in any case of a reconstruction there are great advantages if one can start from scratch, then certainly the Netherlands Railways had that advantage. Perhaps you will allow me to tell you a story of something which happened before the reconstruction.

In the last year of the occupation the Netherlands Government in exile ordered that there should be a strike of the Netherlands Railways, and this brought about a complete standstill of all traffic in Holland for seven months. Now it is one thing to order a strike, in that case a strike against the occupying power, but quite another to organize it because the railway men have to live. The strike had to be financed. The whole country stood together and the money poured into all sorts of fake accounts at the banks; but that money had to be withdrawn, and the only two people who were authorized by the underground movement to withdraw that money from the banks, in order to dole it out to the railway men, are present here at this moment. These two people are Mr. den Hollander and your Chairman. So we might say that Mr. den Hollander has been a railway strike leader in the Netherlands. It seems to me rather exceptional that a railway strike leader should later become the President of the same company. Let us hope that strike leaders to be will not build too great expectations on Mr. den Hollander's example. But, however that may have been, the Germans took their revenge. They stripped our railways and nearly all of the rolling stock disappeared into Germany. That was the sort of scratch from which

the Netherlands Railways had to start and when you come at the present moment to my country, and thousands of tourists come there, I do not think you get too bad an impression. I even hear of some ambitious plans at the present moment to compete with K.L.M. on the journey to Paris. But I must say no more except to thank the Royal Society of Arts for giving Mr. den Hollander the opportunity of speaking here.

*The following paper, which was illustrated with lantern slides, was then read:*

## THE PAPER

It is a great honour to me to have been invited to read a paper to you about the post-war reconstruction of the Netherlands Railways. I gladly accepted your kind invitation as I felt that this was a proof that, in these times when motorized road transport and air transport are trying to draw all our attention, there still is a wide interest in railways, which indeed are the most important means of transport and basic of economic life. Moreover, I greatly appreciate the invitation to give this lecture on reconstruction in the Netherlands as it shows me that the memory of those days when we were fighting shoulder to shoulder for our liberty has as little paled on your side as on ours.

### THE POSITION IN MAY, 1945

Some years before the Second World War the Netherlands Railways had already begun to modernize their railway system. In 1940 16 per cent of the total network of 2,060 miles were electrified. On these lines, situated in the densely populated western and central parts of the country, a frequent service was maintained with electric multiple unit trains. Diesel-electric traction also had by that time made its appearance on the Netherlands railways. Development had, however, been slowed down by the financial situation of the two railway companies into which the thirty-four former companies had gradually been absorbed. The only solution for this was complete reorganization, the liquidation of the two—private—companies and the creation of a new one: the Netherlands Railways Company Ltd. The Government took over all debts, paid off the shareholders and provided the capital for the new company, but constituted it as a private business in accordance with Dutch law. This means that the shareholders—in this case the Government—appoint the board and the committee of management. The company operates on the basis of a licence for the railways within the framework of the Railway Act; it has a separate existence and the railways are on the same footing in the transport business as water, road and air.

In this position Netherlands Railways Company Ltd. started their new life on the 1st January, 1938. They were keener than ever before to modernize their equipment and to take and maintain their place in the transport field.

Then came the disaster of the Second World War. In 1940 the system suffered some damage, but this was quite insignificant compared to the havoc caused to the railways in the period between 17th September, 1944 and 5th May, 1945.

On that most memorable 17th September, 1944, when British and allied airborne troops landed at Arnhem, the Netherlands Government in London



ordered the Dutch railwaymen, as you will no doubt remember, to stop work in the occupied territory, in order to hamper the movements of the German forces as much as possible. This order was obeyed by every man.

At that moment nobody had expected that this strike was to last for seven months: seven months during which the part of the Netherlands Railways in enemy-occupied territory north of the large rivers was exposed to the vandalism and thirst for revenge of the occupying forces.

When liberation came on 5th May, 1945, we were faced with a picture of nearly complete destruction and chaos. At the time of liberation only about 700 miles of the total railway network of 2,060 miles could be used, and 400 miles of this were situated south of the large rivers. It was found that 3,100,000 sleepers and 210,000 tons of steel had been removed.

Of the overhead wiring of the electrified lines, which had a length of 870 miles single track in 1939, only a quarter was left, and even this was in small sections here and there. Only a few substations were still usable. During the strike nearly all bridges across the large rivers had been completely destroyed. In several cases the piers of the bridges had been wrecked together with the spans. In total, 175 bridges had been heavily damaged and 45 bridges had incurred less severe damage. Many station buildings had also been totally destroyed or severely damaged. Eighty per cent of the signalling equipment had been destroyed or damaged. The telecommunication installations were no better.

Whereas the position with regard to the fixed installations was very serious, the rolling stock had incurred even more severe damage. It had been partly removed, partly destroyed. Only 14 per cent of the locomotives could still be used in May, 1945, and only 8 per cent of the passenger coaches. The electric and diesel-electric trains had been stolen, and the rest were either completely destroyed or made useless by dismantling the interiors. Only 1.5 per cent of the goods wagons were serviceable after the liberation.

This in short is the picture of the railway system facing the railwaymen when they returned in 1945. In spite of their poor physical condition, due to the privations they had endured in the last months of the war, they immediately gave their utmost strength to the task of reconstruction.

#### THE PERIOD OF PROVISIONAL REPAIR (1945-1947)

It was of the utmost importance for the rehabilitation of economic life in the Netherlands that the railways should resume the operation of their network as soon as possible. The Government therefore ordered the general management of the railways to take all measures necessary to restore the traffic immediately. In the beginning this was only possible in a very provisional way and on a very restricted scale.

Thanks however to the priority which the Netherlands Government gave to the reconstruction of the railways, and to the co-operation obtained from the allied military and civil authorities, we achieved in December, 1945, 45 per cent of the number of axle-kilometres obtained in the passenger service in December, 1939, and 60 per cent of the number of axle-kilometres in the goods service.

For the provisional repair of bridges use was made among other things of spans purchased in England which belonged to the former Waterloo Bridge, of British Calendar Hamilton auxiliary bridges, and of three German auxiliary bridges supplied by the British Forces. The locomotive stock was replenished by renting and later by purchasing British wartime locomotives, by putting into service new steam locomotives which the Netherlands Government in London had already ordered before the end of the war, and by purchasing a number of second-hand locomotives. The stock of coaches was replenished by using a number of German passenger coaches left behind, apparently forgotten, in the Netherlands, and by renting some Swedish, Danish and Swiss coaches. These were sent back to their respective countries as our own coaches returned from abroad or were repaired. The shortage of goods wagons was partly made good by the purchase of several thousand American Army goods wagons; these have all been sold or scrapped since.

Gradually the length of the network in operation was extended. By the end of 1947 the restoration had proceeded sufficiently for the period of provisional repair to be considered as finished. The entire system was usable again. The provision of transport was, however, far from perfect. There was still a great shortage of seating; the steam locomotives were old; and there were great arrears in track maintenance, so that on many sections we could only operate the trains at limited speeds.

#### THE FIRST STAGE OF THE DEFINITIVE RECONSTRUCTION (1948-1952)

During the years of provisional repair we had to decide on the programme necessary for definite restoration of the system. To draw up this programme we had first of all to decide the extent of the future system. We also had to define the technical equipment of the system, and finally the question arose as to what means would be available for carrying out the reconstruction scheme.

##### *The task of the railways*

In order to define the future extent of the system, we had to consider the task of the railways in the field of national transportation within the framework of the transport policy adopted by the Netherlands Government. This transport policy has tended and still tends towards obtaining and maintaining a reasonable and lasting provision of transport, whereby all transport undertakings should be directed according to economic principles. With regard to the policy of management to be adopted by the Netherlands Railways this means that the management should constantly keep in mind that the company should work at a profit. In this connection it may be stated that the railways, being a public enterprise, need not aim at making large profits, but that a reasonable income on the invested capital should be assured.

Keeping this requirement of earning power in mind, we had also to consider the following points when defining our future task. The Netherlands is a small country with a still growing population. In 1938 it had 8,800,000 inhabitants; in 1948, 9,800,000; and in 1970 its number will probably amount to 12,400,000. Consequently the density of population is very great. The present



density per square mile is 800 against 540 inhabitants per square mile in the United Kingdom. The density of population is greatest in the western parts of the country where the large cities of Holland are situated relatively close to one another. In this region the density amounts to 2,100 inhabitants per square mile. The increase of the population involves, in particular within such a small area as the Netherlands, a considerable increase of its mobility. In the period from 1878 to 1938, during which the population of the Netherlands doubled, the total passenger transport increased thirty-four fold.

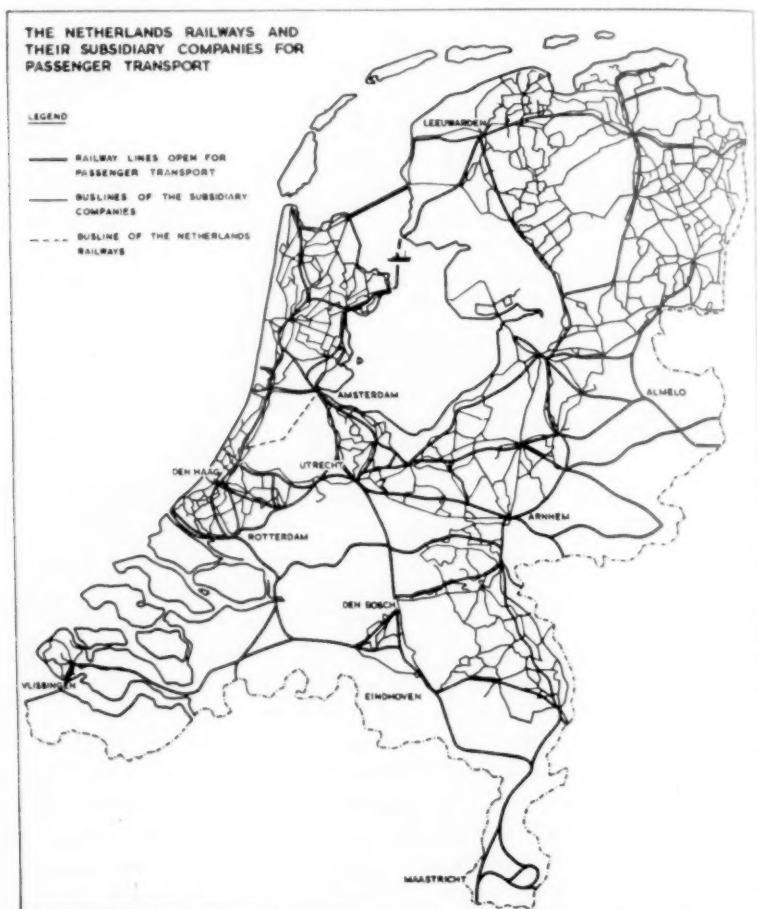
One of the factors which has contributed towards this enhanced mobility was undoubtedly the development of the Netherlands from a predominantly agrarian country in the beginning of this century to a predominantly industrial country such as it is nowadays. To-day an accelerated evolution may be observed as only an intensified industrialization can provide employment for the increasing population.

In view of this development we had to reckon with a growing demand for transport services, both for passengers and goods. However, the railways alone do not satisfy this demand, as there is also transport by road and by water. This factor had also largely to be taken into account when defining the future extent of our railway system. As the Netherlands is a flat country the construction of roads is a fairly easy matter. Consequently it possesses a well-developed network of roads. Its density is four times larger than that of the railways, 0.65 miles per square mile against 0.15 miles for the railways. This density of the road system is, however, not so great as that in the United Kingdom, where it amounts to one mile per square mile or five times the extent of the railway network. The well-developed system of roads offered a wide field of activity to buses and motor lorries, and their competition was soon felt by the railways.

In addition to this system of roads the Netherlands is traversed by a dense network of rivers and canals, which is more than twice as large as that of the railways, with a density of 0.32 miles per square mile. In the United Kingdom this density is only 0.025 miles per square mile. Therefore it is not surprising that water transport plays a predominant part for national and international traffic. Of the total internal goods transport in 1953, expressed in ton-miles, the share of water transport amounted to 53 per cent, that of the railways to 30 per cent and that of road transport to 17 per cent.

Considering the necessity of working at a profit and the severe competition, the task of the railways must be to provide a better transport service to passengers and traders than do the others. For passenger transport this implies that in the Netherlands the railways have to provide connections within the various regions and also interregional and international connections, and that they should come up to the highest possible requirements of safety, speed, frequency and comfort. Particular attention must be given to short distance mass transport, to the connections between the border areas and the economic centre in the middle and west of the country, to connections between the border areas mutually, and, in the international field, to communication with those areas with which close economic relations exist.

Because of this task the railways decided to continue the policy they had followed since 1930, stopping operation on those lines where the flow of transport is so insignificant that railway operation could not possibly be made to pay and where much traffic had already been taken over by the bus, provided the latter could completely absorb the traffic after the railways ceased operation. The railways had already closed 540 miles of their network for passenger transport in this way during the years 1930-1945. In the period 1945-1953 passenger services were closed down on an additional length of 210 miles. Compared with 1930 this means a reduction of 33 per cent in the length of the network in operation for passenger transport.



If, however, one does not consider this from the point of view of the railway business but from that of the railways as a transport undertaking, the difference in extent of the task is reduced. For, after 1930, the Netherlands Railways have also applied themselves to road transport. To-day they have at their disposal

fourteen subsidiary companies, which operate 48 per cent of the total length of the bus network in the Netherlands. These subsidiary companies have partly taken over the traffic on the routes over which rail operation has stopped.

The closing of the non-paying and superfluous lines for passenger transport does not, however, imply that the railway lines left in operation are remunerative. There are many lines which work at a loss but are not superfluous as they constitute a link in the national system. This is indicated by the fact that 80 per cent of the total amount of passenger-miles are achieved on 39 per cent of the network.

For goods transport the main task of the railways in the Netherlands lies in offering to traders a transport organization which covers the whole country and which can, at the same time, provide international transport for their customers in co-operation with the foreign railway companies. They are the only transport organization which offers traders the possibility of entrusting their consignments, big or small, and destined for any part of the country or abroad, to one transport undertaking, on uniform transport conditions.

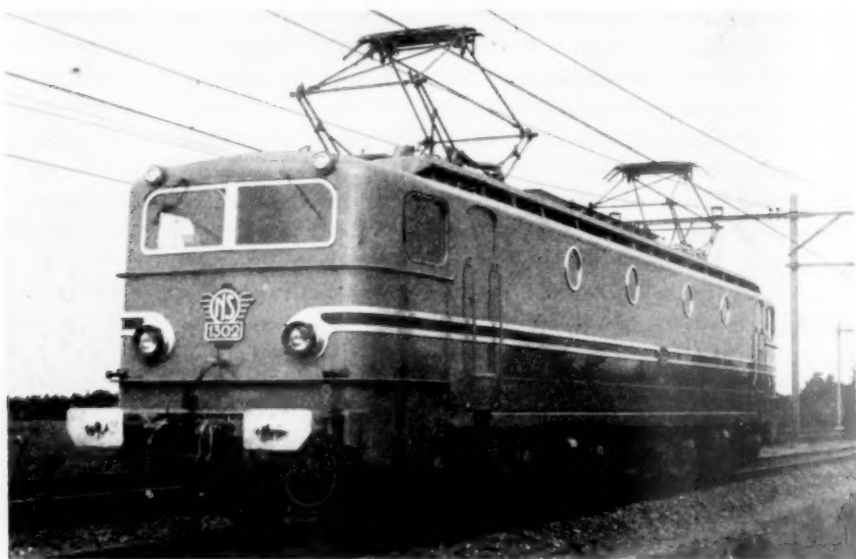
Consequently for goods transport the closing of stations and lines has been much less frequent. Since 1930 325 miles of the network have been closed for goods transport. The lines on which we ceased operating passenger transport after the Second World War nearly all remained open for wagon-load goods transport. Economically this was justified, as the operation of these lines for this type of transport could be continued in a very simple manner. For the transport of smaller than wagon-load goods we could restrict ourselves to our main lines, because for national transport of this type of goods we have already introduced the motor lorry on a large scale into our transport system by means of our subsidiary company, Van Gend & Loos.

#### *The equipment needed for the system*

In considering the task of the railways it was essential for the definite reconstruction of the Netherlands Railways to work out what was needed for the equipment of the system.

In view of the necessity of working at a profit, and the competition which the railways had to face, the equipment had to be as simple as possible and we had to use those means which would enable us to operate at the lowest possible cost. Consequently our reconstruction would be based simultaneously on two factors, rationalization and modernization.

The equipment of a railway system is determined by the time-table. The frequency as well as the speeds of the trains are laid down in the time-table. The Netherlands with its great density of population in a small area and great mobility of population in particular for short distances—the average travelling distance by rail in the Netherlands is 25 miles—requires a transport system which is both frequent and fast. Therefore the general frequency adopted was one train an hour with two to five trains an hour on sections with a high traffic density, this frequency being still more increased on various sections, in particular during peak hours. The trains are mainly operated on a fixed interval



*Electric locomotive of 4,000 h.p. continuous, constructed by the Société Générale de Constructions Electriques et Mécaniques, Alsthom, France*

time-table. Such a system offers various advantages: ample travelling opportunity, easily remembered times of departure and arrival, reduced waiting for departure and connections—in brief, short travelling time for the passengers and a quick turn round of rolling stock and train staff.

This outline of a future time-table using fast and frequent trains over relatively short distances involved the decision—and this may sound hard in your ears here in George Stephenson's native country—to eliminate the steam locomotive in the Netherlands. Its low acceleration power compared with electric and diesel-electric traction makes it unsuitable for a service on short sections with a relatively high number of stops.

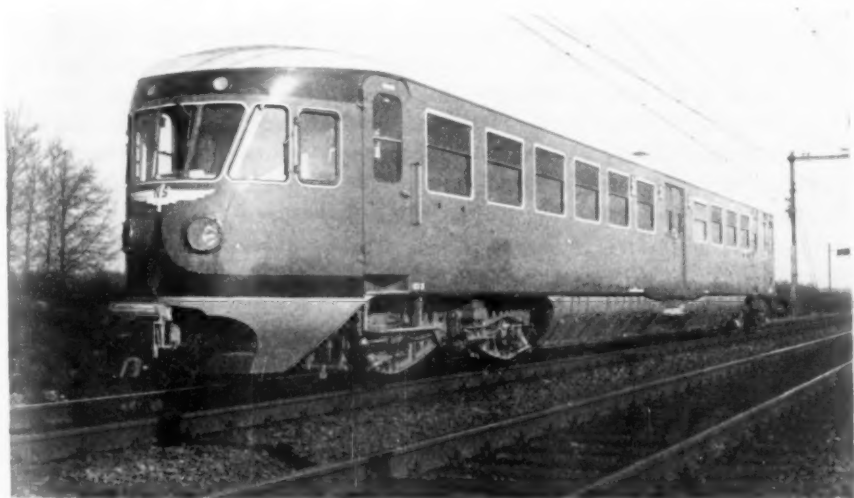
This, however, is not the only consideration which made us decide to substitute electric and diesel-electric traction for steam traction. The modern methods of traction guarantee a much more favourable turn round of rolling stock. Immediately after its arrival at the terminus the train is ready to start the journey in the opposite direction. There is no need for shunting and this means gain of time. Furthermore, the multiple unit rolling stock can be combined or split up by means of automatic central couplers, which are operated by the driver and which do not require any outside help. The electric and diesel-electric service can be carried on with a larger number of smaller trains, thus obtaining a better adaptation to traffic requirements. Another advantage of electric and diesel-electric traction is that time can be made fully productive. On the average, a steam locomotive is only available for service approximately ten hours a day. An electric locomotive can be used for about 23 hours and a full train for 18 hours in the 24.

The number of sheds also can be considerably reduced. Coaling plants, water supply apparatus and turn-tables can be removed. As the trains are able to run in both directions, fewer shunting movements are required, and this makes complicated station yards superfluous and increases the capacity of station tracks and platforms.

Finally there was the important consideration that the thermal efficiency of a steam locomotive is bad compared with the other modes of traction. For a steam locomotive this is not higher than 6 per cent, against 18·5 per cent for electric and 22 per cent for diesel-electric traction. Moreover, as a result of increasing population and rapid industrialization, the Netherlands cannot produce sufficient coal for its present needs, while in 1938 coal production still met the requirements of the country. From the national economic point of view, the replacement of steam traction was therefore highly desirable.

The choice of the part of the network for electric traction and the part for diesel-electric traction had to be made. This was based on cost considerations. Comparative calculations made at the time showed that on all lines having a dense traffic, where the train frequency was more than one train an hour in each direction and an increase in density could be expected, electrification was more profitable, in spite of the high fixed charges which are a consequence of investments in the power supply installations. We therefore decided to proceed to electrify all main lines of the network. For the other lines diesel traction was the obvious solution.

We decided to use hauled trains for long distance traffic on the electrified lines, offering passengers as much comfort as possible, and to use for mass transport over short distances trains with simpler equipment and large platforms



*Diesel-electric railcar, constructed by Allan & Co., Ltd., Rotterdam*

enabling passengers to get in and out quickly. The introduction of hauled trains brought an additional advantage. Goods transport on our network is mainly operated at night. The electric locomotives required for this traffic could now also be used for the daytime passenger services.

The operation of fast trains requires suitable permanent way. In constructing this permanent way, the railways in the Netherlands had to struggle from the outset with the weak layers of peat and clay on which part of the network is built. Where the permanent way is laid on this type of ground there is a risk that the body of the track may sink or undulate under the load of trains passing at high speed. We therefore decided to take adequate measures in those places by laying broad sand foundations and by placing reinforced concrete sheeting under the track.

In addition, considerable arrears had to be made good in track renewal on all parts of the system. In repairing bridges, our attention was needed for two points: reinforcing the track, and providing double track, so that fast good running was possible also on bridges to prevent them becoming bottlenecks in our future operating scheme.

Signalling is allied with the permanent way and a frequent service requires modern signalling systems. This makes a quick succession of trains possible and guarantees the safety and accuracy of rail traffic under all weather conditions. We therefore decided to equip all main lines with the automatic block system and to use light signals for shunting. All main stations will be equipped with the entrance-exit (NX) type of signalling. The modernization of the signalling has been planned for completion in the next ten years.

The stations which had to be rebuilt were of a simple design. Short and straight passenger approaches lead to the platforms. An important feature of the new stations is the link with road traffic. The arrival and the departure of passengers by bus, tramway or taxi should be as near as possible to the central station hall. For connecting bus services, bus stations were designed in many places next to the station building.

In some large towns, such as Rotterdam, Leiden and Eindhoven, which were badly damaged during the war, reconstruction was linked with extensive civil engineering works such as raising of the railway embankments, thus providing bridges to prevent the railways from being an unsurmountable obstacle to the town-traffic at the level crossings.

#### *Means for carrying out the reconstruction scheme*

Although a speedy execution of the programme which I have just described was highly desirable for efficient operation and a satisfactory service to the public, its realization had to take place over many years. In the first place the financial means at our disposal were limited. The State granted us, like all other undertakings, compensation for the material war-damage, which was based on the prices of 1940, taking into account the normal depreciation of the destroyed objects. In addition, we received compensation for the losses incurred through the strike. These compensations together amounted to £35 million. Secondly,



we had at our disposal the money from the depreciations. This amounted to £44 million for the period 1945-1952. Finally the State was prepared, for purposes of modernization of the railway system, to increase the share capital from ten million guilders (approximately £1 million) to 300 million guilders.

Consequently we could invest £107 million up to 1952. During the period 1945-1947 one third of this amount had been used, however, for the provisional repair scheme. Due to the increase in prices, which had occurred during this period, the remaining means were insufficient for the total reconstruction programme. For financial reasons it was necessary to retard the execution. This necessity was emphasized by the fact that we had also to take into account the capacity of our suppliers at home and abroad.

We therefore drew up an urgency programme for the period 1948-1952, in which only the most necessary provisions were decided on. These provisions included the electrification of our main lines for a length of 525 miles and the purchase of multiple-unit trains, locomotives and passenger coaches. The programme also included the reinforcement of the permanent way and the recovery of the arrears in track renewal. The modernization of the signalling system could be started. The large-scale works planned for Rotterdam and Eindhoven could not be completed in this period and the definite reconstruction of a number of stations had to be postponed to a following stage. The renewal of the goods wagons could be only partly completed.

#### THE RESULTS OF THE FIRST STAGE OF REPAIR

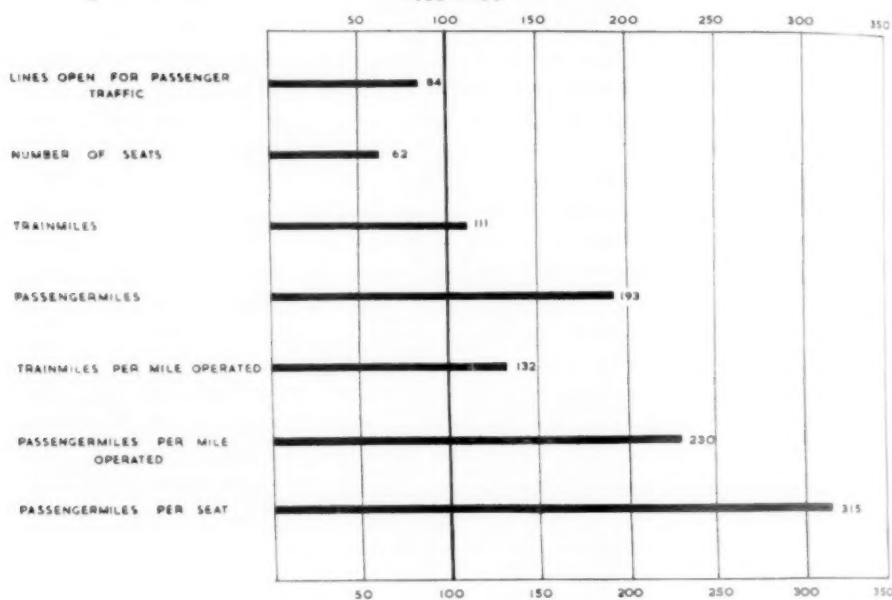
Thanks to the great devotion to their task shown by our staff, and the co-operation we received from our suppliers, we managed to carry out this urgency programme within the time stipulated. Although all the wounds incurred during the war had not yet healed, and the modernization and the rationalization were still in progress, the Netherlands Railways had in 1953 an apparatus which could again fulfil in a reasonable way its task in the transport system of the Netherlands.

To get an idea of what had been achieved in this period it is not only necessary to compare the 1947 position with that in 1953, but it is also essential to compare 1953 with the pre-war situation in 1938. We then see that, in particular with regard to passenger transport, we have restricted our task in accordance with the principles which I have given above.

In 1938 1,840 miles of our network were open to passenger transport. This figure was 1,680 miles in 1947 and 1,550 miles in 1953. On this reduced length of our network we offered, however, a much more frequent passenger service. In 1938 a total of 9,100 passenger train miles were achieved per mile of road. In 1947 this was not more than 6,650 miles. In 1953, however, we had increased this to 12,000 miles per mile of road, an increase of 80 per cent compared with 1947 and of 32 per cent compared with 1938.

This increase in our performance coincided with the extension of the electrification. By the end of 1947 15 per cent of our network had been electrified, as was the case in 1938. At the end of 1953 this percentage was 42 per cent.

**COMPARISON OF THE ACHIEVEMENTS IN PASSENGER TRAFFIC  
IN 1938 AND 1953**  
1938 = 100



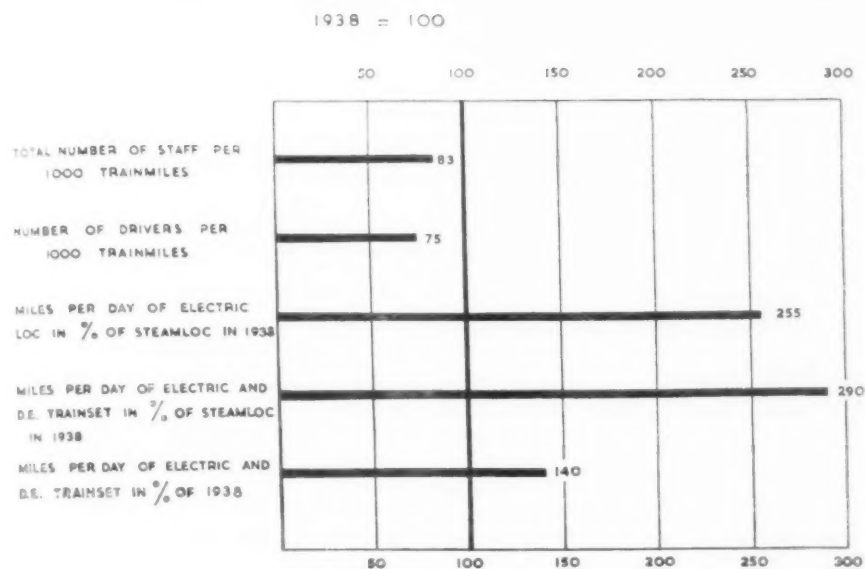
The share of electric traction in the passenger service increased accordingly, namely 25 per cent in 1938 to 71 per cent in 1953. In addition to this, the diesel-electric traction's share was 15 per cent, so that in that year only 14 per cent of our passenger-train kilometres were performed by means of steam traction. In the goods service also the modern forms of traction made their appearance in the years between 1947 and 1953 as 95 electric locomotives and a restricted number of diesel-electric locomotives became available. In 1947 the goods service was still operated solely by steam traction, as was the case in 1938. In 1953 its share had been reduced to 55 per cent.

I wish to show you by means of a few figures to what extent this modernization involved an intensified use of our rolling stock and a rationalization of the production process. In 1938 the average performance of a steam locomotive was 90 miles a day. In 1953 our electric locomotives ran an average of 230 miles a day. The averages of the electric and diesel-electric train sets were raised from 186 miles a day in 1938 to 260 miles in 1953—an increase of 40 per cent.

The influence of modernization on staff requirements may be shown by the fact that in 1953 25 per cent less engine personnel were needed per 1,000 train-miles than in 1938.

As one of the considerations that made us decide in favour of electrification, I have mentioned to you already the economy on the national coal consumption. If we were to carry out the same service as we operate to-day on the electrified

## ACHIEVEMENTS OF STAFF AND ROLLING STOCK IN 1938 AND 1953



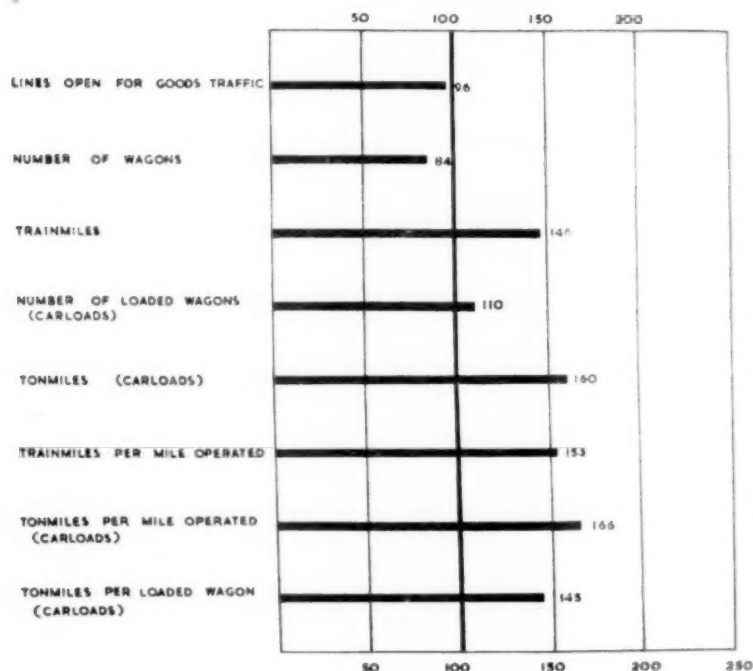
network by means of steam traction our locomotives would consume 650,000 tons of coal more than is required for the generation of the present amount of electric energy consumed.

The improvements made to the permanent way may be illustrated by the fact that in 1947 only on 38 per cent of the network were trains allowed to run at speeds of over 60 miles an hour, in 1953 54 per cent. The installation of automatic signalling rose from 30 miles in 1947 to 200 miles in 1953.

That the reconstruction and the modernization of our system have not been in vain may be seen from the figures of what has been performed with it. The number of passenger-miles on our network in 1953 was 93 per cent more than in 1938. A particular feature was that we achieved this with only 62 per cent of the number of seats we had in 1938. The achievements reached in goods traffic also are well above those of 1938. Our volume of transport in 1953, expressed in tons, was 62 per cent higher than in 1938. Our share in the total inland goods traffic remained almost unchanged. To effect this goods traffic we have at our disposal a wagon stock smaller in number than we had in 1938, but its tonnage is nearly the same as that of pre-war stock.

Considering the first stage of the period of repair from a material point of view, we can state that we have managed to attain more and better achievements with fewer means. This material result has been reflected in the financial field. Thanks to the rationalization of our production, and the increase of our volume of transport, it was possible throughout the post-war period to produce a profit balance sheet.

**COMPARISON OF THE ACHIEVEMENTS IN GOODS TRAFFIC  
IN 1938 AND 1953**  
1938 = 100



In this connection it should also be mentioned that the tariff level has increased to a lesser extent than the general level of prices. For instance, wholesale prices ruling in the Netherlands in 1953 were 335 per cent of those in 1939, whereas the tariff for wagon loads had only been increased to 186 per cent. The index of our passenger fares was in 1953 200 per cent of the 1939 figure, while the index for prices of consumer goods amounted to 270 per cent.

#### THE FUTURE

Although with the completion of our first repair and modernization programme the situation could be called satisfactory, our final object of obtaining a perfectly well-equipped up-to-date railway system had not yet been met. Therefore the urgency programme of 1948-1952 was followed immediately by an investment scheme for the period 1953-1958. While our first programme was predominantly one of electrification, the second is one of diesel-electrification. The electric network will receive a further extension by adding to it the Eindhoven-Venlo line, which is of great importance to international traffic. Moreover we shall also proceed to the electrification of the Roosendaal-Antwerpen line, in co-operation with the Belgian Railways. A frequent service with electric trains between the large commercial and governmental centres

in the western parts of the Netherlands and Belgium, comprising approximately four million people, will be possible by this.

The non-electrified lines are under study. In all cases steam traction will be replaced by electric or diesel-electric traction. For the passenger service this will be done this year, for goods traffic in 1958. Another saving in coal consumption of 350,000 tons will be obtained for the national economy. The scheme also provides for the necessary replacement of part of our pre-war electric stock, partly by train-sets and partly by hauled carriages. Our goods wagon stock will be made up to date.

The vast railway works in a number of towns which we started in the course of the past years will be completed. The largest railway bridge in the Netherlands, near Moerdijk, which is 1,100 yards in length, will be renewed and will have a double track; this will be ready next year. A number of stations which have only been repaired provisionally will be replaced by new ones. The modernization of the signalling system will be further extended. Finally, we hope to co-operate with a number of other European railway companies in the modernization of the international passenger traffic by putting into service standardized diesel-electric trains to link the main centres in Western Europe and these will be operated under the name 'Europ-Express'.

This scheme can only be realized if the railway company is healthy and remains healthy. Normalization, rationalization and standardization are the basic elements. Strong co-operation with industry is indispensable. Finally, the task must be distributed among the three other means of transport in order that the Netherlands Railways remain a profitable undertaking.

When all these conditions have been fulfilled, the railway system will be able to exist and continue its growth. In the Netherlands we believe that there lies an important task ahead, national and international, for transport on the steel road, whose cradle was in your famous country.

#### DISCUSSION

GENERAL SIR BRIAN ROBERTSON, BART., G.C.B., G.B.E., K.C.M.G., K.C.V.O., D.S.O., M.C. (Chairman, British Transport Commission): When Mr. den Hollander was comparing his railway system with the one in Great Britain he told us his was smaller. But I think that most of us who listened to him, if we did not know it before, would have reached the conclusion that the Netherlands system is, as it were, a model of efficiency and extremely go-ahead, and we would readily agree that that is because the system has at its head a very efficient and go-ahead person. Therefore I would just like to remind any of the audience who have forgotten it that the British Transport Commission a few months ago invited Mr. den Hollander to become a Member of their Technical Development and Research Committee which is, as its name implies, an extremely important and top level committee, and that he very kindly accepted. He is not an honorary member nor an affiliated member, but a full-blooded member, with every bit as much right and standing on the committee as anybody else on it.

COLONEL K. CANTLIE: Mr. den Hollander has been speaking entirely of diesel-electric locomotives: has he any comparable experience with diesel-hydraulic and diesel-mechanical locomotives? Secondly, Mr. den Hollander mentioned containers. The Americans are finding that what they call the 'pick-a-back' system of containers

upon wheels is superior to the ordinary containers. I wonder if Mr. den Hollander has tried that system, and whether he can tell us if it is better or not?

THE LECTURER: I am afraid that, although I have been in the railways nearly forty years, I have no experience with other than electrical transmission and the only point for me is that I am so satisfied with what I have that I do not contemplate a change. I think in your country you say never change a winning team. With our team of electrically driven bogies and locomotives and train sets I think we will stay content. Seriously, this campaign about or against transmissions has to be resolved, and in our research centres we must achieve a clear insight into this technical problem. In the States they told me electrical transmissions are heavy and costly, but they work. We have many times calculated other transmissions and always have found that the electrical transmission is the cheapest. Then there comes another factor.

Our men in our advanced electrified system are used to electrical systems. They understand electrical transmission very well. This transmission does not give any difficulty in maintenance, and it is very reliable. We have had a very small locomotive in service for about twenty years. It is only 75 h.p., and from the beginning it has had electrical transmission. It is always outside, even in winter time, handled by the ordinary man in the yards, and we have no trouble at all. You never hear anything about it and I think that is the best I can say about it. Perhaps other transmissions may have possibilities. I do not believe in mechanical transmissions—it would take too much time to go into details but they are too complicated. There is one more reason for electrical transmission. That is, and I think it is easy to understand, you can transport energy through copper wire from any place to any place, but it is very difficult to transport energy through shafts and gears. It is even more difficult to transport it through pipes and they give you many difficult problems. That is why I prefer electrical transmission, but I repeat, this has still to be settled and therefore I hope that we, in our office for research and tests, will have somewhere in Derby or Rugby a set of transmissions on the stands, so that we can study them in every point. But we are not as far as that yet, so I am only giving my personal view for the moment. Perhaps it will have to be changed in the future.

We in the Netherlands see a container as a wagon that has been cut into three pieces and has been removed from the underframe to be more easily removable. We also have trucks that take off the containers and place them on the track mechanically and very easily, and we are very satisfied with this system. I cannot give you an opinion about other systems because we do not use them.

MR. BARRY K. FLAXMAN: Could Mr. den Hollander give us some indication as to the time required to complete the overhead electrification of, say, 100 kilometres? I ask this because there is considerable criticism in this country about the time taken here in the immediate past and required in the immediate future to electrify relatively short stretches of track.

THE LECTURER: I am speaking personally, and with a certain amount of reserve. I can only tell you how we did it. The planning of electrification takes a lot of time because before you are going to realize it you have to go through your yards, you have to consider all your points. Points are costly, you always have too many. The operator always asks for more, the technicians always want fewer. First you go through your points and at once you have your definite layout for your station yards, for your shunting yards, and for your track, and then you can start your signals. Before realizing your electrification, you have to plan for signalling; electrification and signalling ought to go hand in hand. So it takes you years before you are as far as that—the electrification itself is a very easy job. All we have done in electrification has been prefabricated. I have bought a certain number of house-boats, each holding about one hundred men. It is a great help to have these boats which make it possible to



house the men near to their places of work. When you have organized the job in that way, once you have started, you could do about one kilometre each day.

MR. G. VIVIAN DAVIES: I should like to say that as a visitor to the Netherlands this summer, and as a Member of the Institution of Mechanical Engineers who were his guests, we received the greatest kindness from Mr. den Hollander and his organization. I, personally, can testify to the high efficiency of his trains which were absolutely on time—unfortunately a thing of the past in this country since nationalization.

I would like to ask whether, when changing over from steam to diesel locomotion, any trouble or difficulty was experienced in re-training the men, because I am told that steam-engine fitters are used to working to an eighth of an inch whereas, of course, a diesel fitter has to work to within several thousandths of an inch.

THE LECTURER: Yes, that is indeed very difficult, and that is why in 1946, still planning the modernization, I travelled around and explained to the men in the late hours of the evening what I was going to do. It is really very difficult to make a driver, for instance, understand what is happening in electrical equipment and it is more difficult to teach them about the diesel engine and the transmission. I believe that it is less difficult for them to understand the electrical equipment than the diesel. We must realize that the diesel engine to-day is not grown up and is still developing. There are not so many diesel engines which are ready to be used for traction power and one of the mistakes we all have made, I am speaking of the railways, is that we did not put in enough power for a given job. Working with just a little bit less than is necessary has given a lot of trouble, and we must always build in more power than we need. We must not talk about a locomotive of so many horse power, but rather about one of so much weight. To pull you need weight and therefore I have standardized the locomotives in weight. The locomotives you have seen are 34, that means twice 16 to 17 tons; 54, that is three times 18 tons; 60, four times 15 tons, and 72, four times 18 tons, and these metric tons get the limit for the lines where they are used. Then come the diesel engines and put in as much power as possible. No doubt the chief of operations will have them hauling more and more until they stop. A diesel engine that stops is in a worse condition than a steam engine. We design all our locomotives for multiple units, so we do not go in for very big, powerful locomotives; if one is not enough we take two.

Now I come to the diesel fitter. The steam-engine driver on a diesel-engine locomotive who hears something ticking will think that all is well. He never will understand that something is wrong, and he will report too late. So this is really a problem. We have had trouble with the diesel engines in our new train sets, not because these engines are no good, but because the drivers did not understand that, for instance, one has to clear the air intake. It will take time to build up a corps of able drivers who understand from the beginning to the end the engines they have in their hands. On the other hand, we must be very grateful and full of appreciation of what these old timers do, for they really do a very good job.

SIR JOHN ELLIOT (Chairman, London Transport Executive): I would like just to say, as an old colleague of Mr. den Hollander, that I can assure you he has been far too modest; he has spoken only of the Dutch railways, but the truth is that the rejuvenation of the European railway system, regarded as one system, is due principally to two men—Monsieur Louis Armand, the distinguished Director-General of the Société Nationale des Chemins de Fer Français, and Francis den Hollander. As one who had the privilege for three years to sit with them as a Vice-President of the International Union of Railways I can affirm that in this second century of railways, the era of their rejuvenation, the comprehensive and imaginative ideas which you have seen and heard Mr. den Hollander talk about, so far as the Netherlands Railways are concerned, are being applied with the utmost energy and imagination on a much wider field by the Directors-General of the European

railways, led by these two distinguished administrators. I believe we shall see, while we are still alive, the foundation of an entirely new and successful European rail network, successful because the railways will give people and traders the best kind of services they need, by doing those things which they can do better than any other form of traction, and ruthlessly cutting out those things which they ought to have given up a very long time ago.

I feel that this distinguished audience, and the Society, should realize that in seeing and listening to Mr. den Hollander to-day, they are in the presence of one of the great architects of the railways of the future.

THE LECTURER: I should like to tell Sir John Elliot how grateful I am, and how he made me blush. I think I am very lucky in the railway field, and being a railway man I had the opportunity to come into the railways at a moment when something had to be done and could be done. I have had so many friends, Sir John being the first in their ranks, and I have had so much understanding that I could not have done otherwise. So all that Sir John has said goes to him and to his colleagues, and to all men of all ranks in railways, who did such a marvellous job after the war.

Sir Brian Robertson has said words that are very rare and remarkable in the life of a railway man, and I only can tell you that I thank you all in Great Britain from the bottom of my heart, for the invitation that has been sent to me to come over here and be amongst you in your future developments on the railways. I know what you have done in two world wars, and I have seen particularly during the last war and at the end of it and after, what railways in Britain did in their organizations during that war to serve the nation and to serve the free world. It goes without saying that then something else had to be done, but now when you can turn to your jobs and can make your plans, a great thing is going to be done; I am quite certain about that. I consider myself a very lucky railway man that I have the opportunity to be in the centre of developments. I learn a lot here, and for my part I will give you all I can. As you know, I work in the U.I.C. organization for research and experiments, and there I have a very grand staff of engineers, and I think that what Sir John Elliot has mentioned is being done.

MR. A. C. HARTLEY, C.B.E. (A Member of Council of the Society): To-day we have been privileged to listen to a lecture describing how, starting from scratch, Mr. den Hollander has built up the Netherlands Railways to their present high state of efficiency.

Sir Brian Robertson told us of Mr. den Hollander's recent appointment to help British Railways, and I am sure we all feel the greater confidence in the future, and realize we are going to have a lot of help. The only thing I would like to say is that the Council of the Royal Society of Arts invited Mr. den Hollander to give this lecture to-day, before the British Railways thought about getting him to help their staff!

I have the greatest pleasure in proposing a very hearty vote of thanks to Mr. den Hollander.

*The vote of thanks to the Lecturer was carried with acclamation.*

THE EARL OF RADNOR, K.C.V.O. (A Vice-President of the Society): There is one more thing to do and that is to thank His Excellency for taking the Chair at this meeting this afternoon. We are always proud to have eminent Chairmen, it is rare we have an Ambassador.

The excellent paper and the fact that amongst many others two such busy men as Sir Brian Robertson and Sir John Elliot, also very eminent in the transport world, should find time to come to this lecture, I think justifies Your Excellency's giving your busy time to our purposes at the Royal Society of Arts.

*The vote of thanks to the Chairman was carried with acclamation and the meeting then ended.*

# PUBLIC LETTERING

*The Percy Smith Memorial Lecture by*

*CHRISTIAN BARMAN, R.D.I., F.R.I.B.A.,*

*Publicity Officer, British Transport Commission, delivered  
to a Joint Meeting of the Society and the Faculty  
of Royal Designers for Industry on Wednesday, 9th  
February, 1955, with F. J. Stratton, C.B.E., M.A.,  
Chairman and Managing Director, Messrs. Upsons,  
Ltd. (The Dolcis Shoe Co.), and Member of the  
Council of Industrial Design, in the Chair*

THE CHAIRMAN : On this occasion we are met together to honour the memory of Percy Smith. To my great regret I am not one of those who had the distinction of knowing Percy Smith, but all of us in this room are aware of the great influence which his work had on the art of lettering—as a Royal Designer for Industry and one time Master of the Faculty, as a member of the Council of this Society and in a great variety of ways in business.

All of us are very well aware too of the great qualifications of our lecturer. Quite frankly, I do not know where to start when talking about his distinguished career. A Fellow of the Royal Institute of British Architects from his early days in Liverpool; the designer responsible, among other things, for the great change in the traditional design of the ordinary iron; Past-President of the Society of Industrial Artists; a Royal Designer for Industry for ten years; Publicity Officer for the British Transport Commission. He is an old friend of Frank Pick, and had in those terrific days when they worked together an important influence on that fine series of posters issued by the London Passenger Transport Board in the inter-war period, and in a great deal of other valuable work. He is an author of quite wide application. I noticed in the list of his books, which includes those interesting and well-known works on railways and railway architecture, that he had found time even for one novel, and he is described in *Who's Who* as including among his recreations the collection of edible fungi.

Without more ado, I will now present our lecturer to you as I am sure we are all eager to hear what he has to say to us.

*The following lecture, which was illustrated with lantern slides, was then delivered :*

## THE LECTURE

Although most of you, I am sure, would agree on what kind of lettering constitutes public lettering I do not think anybody has ever tried to define it. I shall try and define it very shortly for the purpose of this lecture. By public lettering I understand any kind of lettering that in its particular physical form is meant to be seen by many people. This means that a newspaper heading, which may be seen by a million people, is not public lettering in the sense in which I am using the term, because it is always seen by a particular person reading a particular copy of the paper. The same is true of the lettering on a wine label or a packet of tea. On the other hand, when a large number of people

look at the lettering on a public building, a poster, or a tradesman's van, they are all looking at the same set of physical objects called letters. That is the kind of lettering about which I propose to say a few words to-day.

The first thing that strikes any student of public lettering is the tendency of those who have written or spoken upon the subject to concentrate on the more serious and solemn side—you might almost call it the official side. For every book that has been published on public lettering in general, you will find ten dealing with lettering used for civic, monumental or memorial purposes. We walk and ride about the streets of our cities surrounded by public lettering and when we turn to the experts for illumination we find that their main interest is the lettering that appears on public buildings, tombstones and the plinths of monuments. The late Percy Smith, to whose memory this lecture is dedicated, was one of the exceptions. He took a great interest in shops, business buildings and private houses, and one of his ambitions was to see a good lettering workshop established in every country town, large and small, where local tradesmen and others could be sure to get decent, sensitive lettering carried out by skilled people. Yet even he, in his books and lectures, had far more to say about the official and ceremonial varieties. Instead of trying to dig over again the old ground which he tilled so effectively, I would like to turn rather to the great and striking developments in commercial lettering in recent years. I have an idea that if Percy Smith were now alive and talking to you, that is what he himself might well be doing.

One thing, I think, is clear from my definition. Public lettering, in all its forms, is a very different thing from the kind of lettering that has been discussed by the four previous lecturers in this series. Apart from a brief reference in Mr. Oliver's inaugural lecture, all these speakers have dealt with lettering written or printed in some kind of ink on paper or vellum for the benefit of the individual reader. They have dealt with different varieties of private lettering, small and intimate in scale, on flat, smooth surfaces. The first great difference between this kind of lettering and public lettering is a difference of scale. It is like the difference between the world of insects and the world of mammals. The second great difference is in the material of which the lettering is made and the tools and techniques used in making it. Public lettering may be made of stone, metals, wood, sheet glass, illuminated glass tubing, plastics, paint—there is almost no limit to the choice of materials. And the tools and methods vary accordingly. The third great difference arises directly from the first. In a book or a manuscript the reader is hardly conscious of the shape of the individual letters. Indeed, the best book types are those over which the eye is able to glide almost oblivious of the letter forms and conscious only of a sense of ease and of pervading grace or elegance. The general feeling produced by the letters is like smelling a rose rather than like looking at it. In public lettering you see the letters as it were through a microscope. You look the rose straight in the eye. The individual letter is now no longer a means to an end which is the written or printed page, it becomes an end in itself. Each letter claims, and gets, the reader's full attention.

As these letters have now become so important it may be useful to take a close look at them. These queer angular and rounded forms—where did they come from? Who invented them? Our alphabet, of course, was never invented; it is true that most of it was standardized by the ancient Romans, but before they standardized it, it 'just grewed'. The Romans took it from the Greeks; the Greeks took over their letters from the Phœnicians, but where the Phœnicians got their alphabet we probably shall never know. If we could go back far enough we might discover how some letters came from this civilization and others from that; while, at the very beginning, behind each letter there would stand some symbol that was a simplified picture of some well-known object like a bird or a tree. The Latins took twenty letters from the old Greek alphabet and added G, Y and Z, making twenty-three in all. We have added

again to their work, but our additions still look foreign and second rate by comparison with the original letters. What are these original letters? They are the whole of the capital letters we now use with the exception of W, which was first added by medieval scribes, U, which we owe to the Italian printers of the early sixteenth century, and J, which was first used in Spain at the end of the same century. These three and the whole of our alphabet of small letters are new. The rest, the twenty-three capital letters, are the product of the Romans' process of standardization.

In addition to this standard Roman alphabet of capital letters, or majuscules as the French call them, we now have a second alphabet of minuscules, or lower case as they are called by printers. And like the capital letters in the centuries before Rome these small letters, in the centuries following, emerged in the same way by 'just growing'. They were developed by scribes working with a pen, and they were developed as a means to greater speed, speed in writing and also in reading. Each of these letters, without exception, was evolved out of the corresponding capital letter by a process partly of paring down, of lopping away of inessentials, and partly of amplification. In this flow of ever-changing forms two main landmarks stand out. The first was set up at the end of the eighth century, when a great school of scribes fostered by Charlemagne, and inspired by an English abbot, standardized our two entirely separate series of letters, the



*The evolution of Egyptian lettering: Fifth century Roman mosaic, Santa Sabina, Rome*

capitals and the small letters. The second we find in the work of the Italian typefounders of the middle of the fifteenth century, who cast the first complete alphabets of modern printer's type. Leading up to these two great triumphs of order and normalization lay centuries of trial and error, of exploration and experiment. Out of them the small *b*, *h* and *r*, for example, emerged as capitals with pieces missing, and *d*, *e* and *t* with strokes added on; while the simple, geometrical forms of *c*, *i*, *o*, *s*, *x* and *z* were no doubt found hard to improve upon and were therefore left unchanged. The old capitals L and D were stonemason's forms, like all the other Latin capitals. Yet out of them grew the small *l* and *d* we use to-day, each with its top end stroke pointing left, which is a penman's device pure and simple. Not only different individuals but different trades and tools have all contributed towards the slow and painful birth of those 52 symbols that we to-day so easily take for granted.

By the end of the fifteenth century, then, the modern alphabet was fixed. True, there were still two letters to come, but it was fixed all the same. If you go into any English printing shop to-day you may see the capital letters in their case laid out in the proper order, but the letters J and U are missing from their places. Then you notice that those have been added at the end, after X Y Z. That type case was designed by the first great printers of modern times; during the four-and-a-half centuries that have since passed there have been changes and additions, but the original arrangement was not disturbed until the arrival of the typewriter and type setting keyboards in the lifetime of people still living to-day.

I have talked a great deal about printers, and I have had to do so because for three centuries the printed letter has been invested with a special kind of authority; it has been the source from which other craftsmen's letters have been taken and the standard by which they have been judged. Once the craft of book printing got under weigh the book reigned supreme; book types alone set the standard. Smaller types might be wanted for almanacs and for marginal notes, and larger ones by signwriters and monumental masons, but these were mostly reduced or enlarged adaptations of the types designed for books. Those of you who were present at Sir Francis Meynell's lecture may remember his beautiful illustration of the tradesman's slate sign which was used by John Baskerville, which so unmistakably shows its kinship with his lovely printers' types.

But while the stream of inspiration flowed steadily from printers' type outwards to other lettering there were, of course, lesser streams trickling in a reverse direction, so that printer's types in their turn were influenced by the work of other crafts. Mr. Carter in his lecture referred to the influence of stonemasons, scribes and jewellers in helping to determine our original letter forms. The best lettering to-day owes its qualities to a merging and blending of characteristics given to it by the three major crafts involved: the letter cutter in stone, wood or metal, from whom its forms got their sharpness of definition; the writer with pen or brush, from whom they got their continuous flow of graceful line, and the cutter of typefounders' punches, whose special contribution is the shape





*The evolution of Egyptian lettering: Brass-founder's lettering; a Great Western Railway engine splasher*

and proportion of those white spaces inside the letters that are so tremendously important in making for clarity, legibility, and good appearance.

At the beginning of the last century a new kind of craftsman began for the first time to influence letter forms. The ironfounder's pattern maker who cut his letters out of wood began to evolve new forms which came naturally to his materials and his tools, and these forms were so full of interest that he was followed by other craftsmen including typefounders. It is to him that we owe the revival of sanserif letters, which had been used only very rarely in earlier centuries, and the emergence of a new letter altogether, the so-called Egyptian whose big, square-cut block serif continues to enjoy great popularity in public lettering and in advertising types to-day.

The letters I have been discussing so far are all letters made with tools like pens and chisels, drills and saws, or derived and translated, as it were, from these craftsmen's letters. But suddenly, at the end of the last century, a new kind of person appears; the craftsman who makes things with tools is supplanted by the draughtsman who draws letters on a drawing board using the same kind of instrument as a draughtsman making engineering drawings. It was, if you like, a new kind of freedom for the lettering designer, a freedom from the limitations of the tools that had governed letter forms since the earliest times; but it was a liberation that came very suddenly, and sudden liberation can be a dangerous thing. Mr. Oliver had a few lines in his lecture to describe what happened at that time, and I cannot improve on his words. 'By the end of the nineteenth



*The evolution of Egyptian lettering: The signwriter's three-dimensional version; a canal boat cabin*

century', he said, 'all lettering in England had sunk to an exceedingly low level. Alphabets became mixed, poor medieval forms became grafted on Roman, fancy excrescences abounded in the printed initial, printers' types were known as "crazy", and all was chaos, as the lettering books of the period will show'. The chaos was general; it was by no means confined to printers. And the chaos was made even more crazy when architects and designers started to twist and torture their mixture of medieval and Roman forms into new shapes inspired by oriental art, and more especially by the art of Japan. This final catastrophe is usually associated with the Art Nouveau movement which sprang up in France about the year 1900, but Dr. Pevsner has recently reminded us that the Japanese influences in European industrial art first spread from the Paris exhibition of 1862 where the Japanese section attracted immense attention. What Mr. Betjeman has called 'the lily roots and twisted horrors' of Art Nouveau was only the culmination of a process that had been going on for forty years. I do not think there can be any doubt that in this country, by acting as a kind of emetic, Art Nouveau lettering helped to stimulate the revolt against the chaos that the drawing-board draughtsman had let loose upon us.

In the decade before the First World War there was certainly a growing

feeling that the design of lettering was becoming too much of a riot and that something must be done to bring it back to order and sanity. And the only way to bring it back to sanity was to establish some kind of agreed and accepted norm. A norm is not the same thing as a standard; it is a yardstick to be referred to, not a finished design to be copied; it is a starting point rather than a point of arrival. But when the new alphabet which was to restore order and sanity did in fact arrive it turned out to be a standard after all. Under the dead hand of the Trajan alphabet, recorded and measured and dimensioned as accurately as a British Standards Institution standard for drainpipes or engineering components, the art of public lettering withered away like overblown garden flowers in the first autumn frost.

What was this Trajan alphabet? It was a set of letters taken from a carved inscription on one of the least interesting and attractive monuments of Ancient Rome, the Trajan column. This extraordinary object, 116 feet high, was wrapped from top to bottom in a coil of sculpture glamorizing the Danubian campaigns of the Emperor Trajan. The grateful people of Rome had chosen this way of paying tribute to a war-lord whose invasion of the Parthian Empire only just managed to avoid wrecking their own great civilization. If you can imagine Hitler having an official war film directed by D. W. Griffith you will get some idea of what this column was like, with its continuous band of sculpture 700 feet long going round the column 23 times and containing about 2,500 human figures, with Trajan, the hero, making some 70 personal appearances at intervals of two or three yards to get his generals out of a fix. If the column made a great impression on Renaissance artists and scholars it was not so much by its artistic quality, which is negligible, as by the sheer bulk of its sculpture content. Only the prestige derived from this record-breaking output of artists' footage can account for the fact that this particular monument was chosen half a century ago to provide the civilized world with its only standard alphabet for public lettering.

The one good thing about the monopoly of the Trajan lettering is that it did not last very long. The man who broke that monopoly was Frank Pick, at that time the commercial manager of the Underground group of companies which controlled most of London's underground railways and the London General Omnibus Company. About the year 1912 Pick had come under the influence of a small group of people who were trying to reform English typography and printing design and, being very unhappy about the signposting at Underground stations, he decided to see if he could apply their ideas and their methods to the public lettering for which he was responsible. In November, 1916, he spoke about his ideas to the students of the Leicester School of Art. He had aimed, he said, at letters that would have the bold simplicity of the authentic lettering of the finest periods and yet belong unmistakably to the times in which we lived. Great harm had been done to these letter forms by the self-conscious designers of the nineteenth century; they had, he said, become perverted; they had become 'the sport of artists'. The letters of the alphabet were the symbols that had held European civilization together for over two thousand years; you



*Edward Johnston's Underground lettering:  
Westminster Station in the early 'twenties*

could not take liberties with that kind of symbol. He described to the students what other people were doing to restore the purity of letter forms, and he had a word of praise for the classical lettering that Eric Gill had done for some of the bookshops of W. H. Smith & Son. But though he thought highly of this lettering he did not feel that it was suitable for the purpose to which it was put. Gill, who was a stone mason, was using the letters of the monumental masons of ancient Rome, letters designed as incised letters cut in a slab of stone; they were meant to be read with the bright Italian sunlight caught in the sharp groove of the strokes, set against a dark line of shadow. In the Smith's shop fronts these letters had been written out in paint on a flat surface and it was impossible that such an adaptation should be altogether satisfactory.

Pick went on to explain to his audience his own approach to the problem. He had started from the station name sign meant to be read quickly and easily by passengers sitting in a train. Each letter in the alphabet must be a strong and unmistakable symbol with a high degree of individuality; its structure must be clear and open; since the lighting on the station platform was likely to be less bright than the lighting in the train it must have the greatest possible carrying power. It must be straightforward and manly, with the character of an official railway sign that was not to be mistaken by people in a hurry for a trader's advertisement.

The sanserif letter, which Pick decided to use, belonged to the variety that was

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PUBLIC LETTERING

normally used for station signs by most railways in this country. But it was not the only kind of railway lettering; a very different kind, for example, was used on many locomotives. I am pretty certain that it was Harold Curwen, the printer, who encouraged Pick to put his faith in the sans-serif alphabet. But if Pick's typographer friends, and mainly, I think, Curwen and Gerard Meynell, produced the ideas, the intellectual stimulation, it was Pick who supplied the drive and the energy that made those ideas bear fruit. He was a man of extraordinary courage, and on this occasion he showed his courage by commissioning Edward Johnston, the calligrapher, to design his alphabet for him. Johnston's fame as the re-discoverer of the art of fine writing had spread all over Europe and he had designed some types for Count Kessler's private press at Weimar, in Germany. But those printing experts who had tried to get the big English firms of typefounders to employ him had had no luck at all. Johnston designed only one printing type in England: it had the same characters as those he produced in 1916 for use as public lettering, and it was designed for the same client, Frank Pick. When Mr. John Dreyfus wrote about Pick's Johnston type



*Edward Johnston's Underground lettering:  
St. James's Park Station to-day*

in an article published in 1947, he said: 'Pick's thoroughness in carrying out this programme gave Meynell's suggestion and Johnston's execution the rank of a typographical event of unprecedented success and significance. The Johnston Underground sanserif was the greatest single practical contribution that has been made to good printing in the last thirty years. But this was not all. Its standardization on the Underground conferred upon it, as lettering, a sanction, civic and commercial, such as had not been accorded to an alphabet since the time of Charlemagne. It was a contribution to the art on a truly majestic scale'.

I said just now that the importance of Johnston's Underground lettering lay in the fact that it provided a new yardstick or norm. Up to the time of the Trajan revival public lettering had been based on book types; the typefounders' letter cutters were the real carriers of the best traditions and most other letters were in one way or another derived from these types. But these traditional types had got into the hands of uneducated draughtsmen working with set-squares and compasses and pantographs and other drawing board instruments, and so the letter forms had gradually become distorted and all but destroyed. Ruskin was one of the first to draw attention to the work of the medieval writing masters, the first to realize that all lettering is born of writing, that book types are only the fruit of the tree and not the root, and that if new conditions demand new and different lettering you must go back to the beginning and start afresh. The old book letters grew out of writing and new letters must grow out of writing too. Ruskin saw this, but he was able to give us very little information about writing or letters. This was left for Edward Johnston to do. In 1906 Johnston wrote a book in which the art of written lettering is studied with a thoroughness and degree of insight that have not been surpassed. A quotation at the front of his book tells us how Johnston felt about his explorations: 'I began to seek for the enamels as a man gropes in the dark'. Johnston did indeed begin his work as a man groping in the dark, but he finished it as a master of his ancient craft and a teacher of world-wide reputation.

The adoption of Johnston's lettering by the Underground did something else besides establishing a norm: it made the educated public lettering-conscious. Perhaps for the first time in our architectural history, it caused lettering to be regarded as a significant vehicle of living creative design. And in the hands of the contemporary designer lettering has now assumed a special importance because of its direct connection with the past, and especially with his own, national English past. The architects of fifty years ago made the mistake of thinking that you could leapfrog over your immediate ancestors and pick up an older tradition, from the thirteenth century maybe, or from the age of George I, or from eighteenth century Japan. The truth is that continuity with the past can only be established by linking up with the latest living tradition, and the latest living tradition in this country is that of the reign of Queen Victoria. We have gone back to Victorian lettering with a new understanding which we owe to Edward Johnston and the scribes who were taught by him. We have gone back to it equipped with the new norm or yardstick that Johnston provided in his Underground alphabet. And as we look at it again with this new knowledge and





*The evolution of Egyptian lettering : The twentieth century revival ; Turntable Restaurant, Festival of Britain*

understanding we find that we are able to test it and sift it, and pick out the good from the bad. And we have made the astonishing and very pleasant discovery that mixed up with this tangled growth of coarse and crazy and barbarous lettering that flourished in the last century there is a great deal that is very good indeed.

The biggest single leap forward in this process of sorting and selection was taken by the organizers of the Festival of Britain three years ago when they appointed Mr. Gordon Cullen adviser for all external public lettering on the South Bank. Mr. Cullen with his typographical panel assembled some of the best Victorian examples in our official pattern book. Their pattern book was not imposed on exhibition designers; designers were free and indeed encouraged to produce individual lettering of their own. Its influence was due to two things: first, the emphasis that was put on lettering as a highly important element in the design of a visual environment; and, secondly, the sheer quality of its contents. For the first time, the finest Victorian sanserifs and Egyptians were brought together in an official publication and displayed in all their variety of outlined, shaded, textured and decorated interpretations. It is not surprising that the influence of Mr. Cullen's work has spread far beyond the exhibition for which it was originally carried out.

As you look round the streets to-day you will see all the lettering around you fluctuating between two extremes, the extremes of normality and exclusiveness. The most exclusive lettering is that which comes nearest to being a trade mark that unmistakably projects the identity of its owner. It is not a coincidence that this highly particularized trade mark type of lettering should be most widely used by businesses with multiple shops. Take, for example, the name sign

used by the Dolcis shoe shops, which are presided over by my friend who is presiding over me this afternoon. If you want to see how fine is the quality that Reynolds Stone, the designer, has put into this lettering you have only to think of other equally familiar trade marks using scripts, like Boots the chemists, or Coca Cola. It makes a first-class trade mark for two reasons: first, because there is nothing remotely like it anywhere else in this country, and, secondly, because it is not founded on some passing fashion; it achieves exclusiveness but has retained all the virtues of sanity and normality. Other interesting devices of this kind are those of Richard Shops (designed by Mr. Ashley Havinden), Kardomah (designed by Mr. Milner Gray), Sainsbury, which is based on a modern German printers' type called Albertus, and the British Overseas Airways Corporation, which uses a modern sanserif type designed by Mr. Ernest Ingham.

But there are certain kinds of multiple shops in which a very great quantity of lettering is needed, a quantity element as great as on a railway like the underground. In that kind of shop the management may well feel that uniformity of all lettering is more important to them than the possession of an exclusive fascia board symbol. Perhaps one of the most familiar symbols of this kind is the old sign of the Lyons teashops, with its faint odour of Art Nouveau, but redeemed by the succulent forms of its round section gold letters on a white ground that might almost have been extruded from a pastrycook's icing bag. When Lyons replaced this name board with one based on Eric Gill's well-known Perpetua Bold capitals they threw away what must have seemed to them a very useful asset. But by making this sacrifice they were enabled to impose the discipline of a single standard alphabet on all the lettering used in every part of the shop. One of the oldest examples of this standardization is that which Percy Smith produced for Heal & Son in many different applications. One of the latest is the comprehensive design programme undertaken for Courage, the brewers, by Mr. Milner Gray. In their public houses you will find the same fine lettering that appears on the outside and inside of the building carried through to every kind of equipment—jugs, ashtrays, and the labels on the bottles in which the firm's beer is sold. No one who studies the appearance and the contents of these public houses can fail to realize that the universal use of this fine and highly normal alphabet has done more to give them a peculiar individuality of their own than some special and exotic nameboard could possibly give them.

For, however great the attractions of special and individual lettering may be, there is plenty of room for simple normality. There is room for it in public buildings like the University of London, which has lettering designed by George Mansell, and in the special signposting carried out by a great national body like the Ministry of Works. And there is room for it also in our shopping streets. The highly exclusive trade mark shop front lettering is of little value to the individual tradesman. Its value arises from its repetition; it is repetition that makes it a recognizable symbol and gives it meaning. The individual shop, which has the distinction of uniqueness, can best show its pride in that distinction by using simple, normal lettering of a more generalized kind. And by doing that it also enhances the value to the multiple shop of its own particular lettering.

whose differences became most noticeable when they are seen against a background of normality. What a splendid thing it would be if a famous street like Bond Street or Regent Street were to express its identity and its unity by adopting a normal standard alphabet of its own like those that are used by London University, Courage, or Bush House.

I hope I have conveyed to you in this talk my feeling that public lettering to-day is in a condition of greater vitality than it has been for a very long time, and is making an increasing contribution to the beauty and interest to our cities. I think this new vitality is largely due to the fact that lettering just now gives the architect something that he cannot easily find elsewhere. The modern architect in his buildings has turned his back on tradition; his face is turned to the new industrial processes on which he must try to impose some sort of order. But he keeps on looking over his shoulder at the past, which is always there, close behind him, and in all the traditions of the past there is only one that he trusts and believes in, only one with which he is not afraid to associate himself, and that is the tradition of lettering. The revival of lettering has become the best part of the Victorian revival, and the architect now looks to it for the means to give friendliness, gaiety and humanity to buildings that otherwise might seem unbearably austere. At this time we may say that public lettering has become the stem—only a small, thin stem, but a very live one—that connects modern architecture with its roots in our island history.

THE CHAIRMAN: I am sure that you would wish me to say how glad we are that Mrs. Delf Smith was able to join us this afternoon.

It is now my pleasant task to thank the lecturer for his paper. We have all spent a most fascinating and enjoyable hour. I noticed that Mr. Christian Barman finished his lecture in good railway style, dead on time. I thought that, as we travelled, we did so very pleasantly and inspiringly from Peterborough North round by Walby and along to my own particular location among the shops. I think it is very good for all of us, no matter what may be our walk in life, to be able to come on an occasion like this, and to take an hour or so off to examine principles and to collect inspiration; for how greatly creative inspiration is needed in this particular field, about which Mr. Barman has been talking!

What a great contribution was made by Percy Smith in the past, and how truly that work lives and continues; I think one may say, from what we have seen and heard this afternoon, that progress is being made. How appropriate it is to-day that we should have lecturing to us an R.D.I., when one remembers Mr. Smith's own connection with the Faculty. I am sure you would like me to thank Mr. Barman very much indeed for his penetrating, instructive and inspiring lecture.

*A vote of thanks to the Lecturer was carried with acclamation.*

SIR GORDON RUSSELL, C.B.E., M.C., R.D.I. (Director, Council of Industrial Design): I am sure you would not wish me to leave this Hall without thanking the Chairman on your behalf. I suppose nothing would seem more remarkable to a medieval shop-keeper than to come back and see the way the signs of the Middle Ages have been replaced by an enormous amount of lettering in our shopping centres. No one, I think, could more fittingly have taken the chair this afternoon than our chairman, who has been responsible for putting into practice what the lecturer has told us in his fascinating lecture.

*The vote of thanks to the Chairman was carried with acclamation, and the meeting then ended.*

## G E N E R A L      N O T E S

## MR. WHITTY AND THE SOCIETY OF ARTS

*In 1757, 1758 and 1759 Thomas Whitty, of Axminster, received the Society's premiums for making 'the best carpet in one breadth, after the manner of Turkey carpets, in colour, pattern and workmanship'. His account of his commencement, which was the start of the Axminster carpet industry, was published in Furnishing, of March, 1955. As it is thought that Fellows will be interested to read this, part of it, describing his first application for the premium, is reproduced below:*

'When I came home, I immediately begun to prepare a loom and materials for making a Carpet, and on MIDSUMMER-DAY 1755 (a memorable day for my family) I begun the first Carpet I ever made, taking my children, with their Aunt Betty Harvey to overlook and assist them, for my first workers. When the manufacture was thus begun, many gentlemen came, out of curiosity, to see it, and professed their desire to encourage it, by ordering for Carpets. Among them, one of the first was Mr. Cook of Slape, near Beaminster, who ordered for a carpet from the first pattern I ever made. When I carried this Carpet Home, I met Mr. Cook at Beaminster, who desired me to open it to show it to a gentlemen then with him. This gentleman was a Mr. Twynihoe, of the Temple, London; and was steward to the Earl of Shaftsbury. He was much pleased with the sight of it, and told me he should be glad to render me all the services he could for the encouragement of a new manufacture. Accordingly he mentioned it to Lady Shaftesbury who was a liberal encourager of Arts and manufactures. Her Ladyship desired him to request Mr. Cook to spare her that carpet, as she imagined it to be the first carpet that had been made; saying, that she wished to have the first carpet of the manufactory, although she might expect to have a much handsomer one, when it was come to greater maturity. Lord and Lady Shaftesbury were so well pleased with that Carpet that they and their family have been since some of our best customers.

In the summer of 1756 I received an order from Mr. Twynihoe for a carpet for a friend of his, and enclosing in his letter the first proposals of the Society for promoting Arts and Sciences, of giving a premium for the encouragement of making Carpets in England on the principle of Turkey Carpets, pointing to the proposal of giving £30 to the person who produced the best carpet, made on that principle, not less than 15 feet by 12 feet, and £20 for the second best, of the same dimensions; with this observation, "*It would do you no harm to receive this premium next year*".

Accordingly, in March 1757, I produced a Carpet to that noble Society, about 16 feet by 12 feet 6, which I valued at £15. Mr. Thomas Moore of London produced another of about the same dimensions, which he valued at 40 guineas. The Society were convinced, on examining both carpets, that although Mr. Moore's was made of the finest material, and therefore cost him more money in making, yet that mine was the best Carpet in proportion to its price. They therefore recommended it to Mr. Moore and me to take the fifty pounds, and divide it equally between us; which we agreed to do.

## C O R R E S P O N D E N C E

## EQUALITY OF EDUCATION

*From MISS LAURA BRANSOM (PAST PRESIDENT, NATIONAL ASSOCIATION OF HEAD TEACHERS), 48 ALCESTER ROAD, STRATFORD-UPON-AVON*

I notice in your account of the discussion on the above subject published in the last issue of the *Journal* that someone pointed out that if all Secondary Modern schools were good ones, which at present was disputable, the prejudice against them should disappear and with it the distress of selection.

Whoever made this observation has, I venture to say, very little knowledge of the realities of the situation. As long as it is known that the unselective Secondary Modern schools are those in which the 'less bright' children are placed—and this is how the selective principle is universally interpreted among parents—then, however excellent the schools may be and however well they may be discharging their function, the prejudice against them will persist and with it the distress of selection.

Consequent on this attitude, moreover, these schools will remain among those most difficult to run successfully and in which the skill and devotion of the teaching staff are most severely tested.

Would that this fact were more widely and generously acknowledged!

### SHORT NOTES ON BOOKS

ANTIQUES, A TO Z. *By Edward Wenham. Bell, 1954. 12s 6d*

This 'pocket handbook for collectors' consists of twelve glossaries each dealing with a different class of antique. The largest section is on furniture, but there are others on pottery and porcelain and on such things as barometers, and furniture woods. The book is copiously illustrated.

LITERATURE AND SCIENCE. *By B. Ifor Evans. Allen & Unwin, 1954. 8s 6d*

This deals historically with the relations between literature and science and discusses the progressive alienation of one from the other from the time of Newton until our own. In particular, Wordsworth's attitude to the problem is re-examined.

### FROM THE JOURNAL OF 1855

VOLUME III. 16th March, 1855

*From the discussion following a paper On A New Method of Teaching Drawing, involving the Principle of a New System of Architecture, by Herr Joseph Kumpa, of Dresden.*

With regard to the architectural part of the subject, he (Mr. Wyatt) would remind the meeting to be upon their guard, since there was great danger in hastily adopting any system of form as new, and recognizing it as likely to engender any new and 'natural' system of architecture, for in the first place any such adoption or recognition would involve the ignoring of the labours of generations of wise and able men; even supposing, in the second place, that this responsibility could be assumed, and that all that had gone before was ignored, grave difficulties would yet present themselves; since it was to be remembered that the danger of a rigid geometrical basis in art was that its presence and imperative laws prevented the student from exercising himself in those minute refinements of form which lend their winning charms to the highest order of grace. In Greek architecture and other styles of eminently subtle beauty, the geometrical figures in use could only have been exercised by artists who united the highest powers of imitative drawing with a refined knowledge of the mathematical principles of pure geometry, not to be attained by any prosecution of the system of straight lines and portions of circles they saw before them. The Romans converted the beautiful ovoid, hyperbola, and parabolic curves of the Greeks, into those most easily struck by an ignorant workman with a compass. As in that case so also in the Gothic, and even in Moorish art, the triumph of elementary geometry showed the already commencing mortification of the vital part of the art. While geometrical tracery, degenerating into liness, superseded those curves and flowing forms that were found in early English ornamentation, a system of manufacture came in, which gave a death-blow to poetry and inspiration.

## Some Activities of Other Societies and Organizations

## MEETINGS

- MON. 21 MAR.** British Decorators and Interior Designers, Incorporated Institute of, at the Royal Society of Arts, W.C.2. 7.30 p.m. John Farleigh: *Design as a Professional Problem*.  
Imperial Institute, South Kensington, S.W.7. 5.45 p.m. S. Ldr. B. S. Leete: *Island Defence & Communications*.
- TUES. 22 MAR.** British Architects, Royal Institute of, 66 Portland Place, W.1. 6 p.m. Prof. W. Fisher Cassie: *Comparisons in Modern Structural Steelwork*.  
Civil Engineers, Institution of, Great George Street, S.W.1. 5.30 p.m. E. E. H. Bate and D. A. Stewart: *A Survey of Modern Concrete Technique*.  
International Affairs, Royal Institute of, 10 St. James's Square, S.W.1. 1.30 p.m. The Rt. Hon. Hilary Marquand: *The World War on Want*.  
Manchester Geographical Society, 16 St. Mary's Parsonage, Manchester, 3. 6.30 p.m. R. Kay Gresswell: *Rocky Cliffs and Sandy Shores*.  
Petroleum, Institute of, 26 Portland Place, W.1. 6 p.m. T. F. Brown: *The Manufacture and Uses of White Oils and Sulphonates*.  
Physical Society, at the Science Museum, Exhibition Road, S.W.7. 5 p.m. Prof. E. C. Stoner: *Magnetism in Retrospect and Prospect*.
- WED. 23 MAR.** Central Asian Society, Royal, at the Royal Society, Burlington House, Piccadilly, W.1. 1.30 p.m. Hon. Roger Chorley: *By Car to the Karakorams*.  
Electrical Engineers, Institution of, Savoy Place, W.C.2. 5.30 p.m. (1) J. Christie, H. Leyburn and I. F. Bird: *Proving the Performance of Circuit-Breakers, with particular reference to those of Large Breaking Capacity*. (2) J. Christie, H. Leyburn and R. W. Fenn: *A New Testing Station for High-Power Circuit-Breakers*.  
Eugenics Society, at the Royal Society, Burlington House, Piccadilly, W.1. 5.30 p.m. Mrs. Hilda Lewis: *Inadequate Parents and Psychological Disorders in their Children*.  
Italian Institute, 39 Belgrave Square, S.W.1. 6.30 p.m. Dr. Cecilia M. Ady: *Italian Cities of the Middle Ages and the Renaissance: Bologna*.  
Modular Society, at the Royal Society of Arts, W.C.2. 7.30 p.m. W. A. Allen: *Modular Co-ordination Research—The Emerging Pattern*.  
Victoria & Albert Museum, South Kensington, S.W.7. 6.15 p.m. Wilfrid Blunt: *English Botanical Illustration*.
- THURS. 24 MAR.** Fuel, Institute of, at the Institution of Civil Engineers, Great George Street, S.W.1. 5.30 p.m. W. F. B. Shaw and J. W. McHugo: *The Development and Use of the Calorimeter Building at the Fuel Research Station, Greenwich*.
- FRI. 25 MAR.** British Sound Recording Association, at the Royal Society of Arts, W.C.2. 7 p.m. F. H. Brittain: *High Fidelity Reproduction in the Home Using the Metal Cone Loudspeaker*.  
Engineers, Junior Institution of, Pepys House 14 Rochester Row, S.W.1. R. D. Gifford: *Amateur Telescope Making*.  
Mechanical Engineers, Institution of, 1 Birdcage Walk, S.W.1. 5.30 p.m. R. C. Worster and D. F. Denny: *Hydraulic Transport of Solids*.
- MON. 28 MAR.** Imperial Institute, South Kensington, S.W.7. 5.45 p.m. Dr. B. W. Gussman: *Race Problems in the Islands*.
- TUES. 29 MAR.** Civil Engineers, Institution of, Great George Street, S.W.1. 5.30 p.m. L. R. Greenaway and J. Callagin: *The Extension of the Runway at R.N. Air Station, Belfast*.  
International Affairs, Royal Institute of, 10 St. James's Square, S.W.1. 1.30 p.m. D. Nevill Easton: *The Emancipation of the Arab World*.  
Manchester Geographical Society, 16 St. Mary's Parsonage, Manchester, 3. 6.30 p.m. Eric D. Fish: *Impressions of West Africa*.
- WED. 30 MAR.** Archaeological Institute of Great Britain and Ireland, Royal, at the Society of Antiquaries of London, Burlington House, Piccadilly, W.1. 6 p.m. J. N. L. Myres and E. Clive Rouse: *The Britons—Painted, Frieze and other discoveries in the Old Library*.  
British Kinematograph Society, at G.B. Theatre, Film House, Wardour Street, W.1. 7.15 p.m. H. P. Woods: *The Measurement of Cinema Screen Luminance*.  
Victoria & Albert Museum, South Kensington, S.W.7. 6.15 p.m. B. W. Robinson: *Japanese Landscapes: Prints and their Associations*.
- THURS. 31 MAR.** Anthropological Institute, Royal, 21 Bedford Square, W.C.1. 5.30 p.m. W. M. Williams: *Kinship in a West Cumberland Parish*.  
Electrical Engineers, Institution of, Savoy Place, W.C.2. 5.30 p.m. E. W. Golding: *Electrical Energy from the Wind*.  
Refrigeration, Institute of, at the Institution of Mechanical Engineers, 1 Birdcage Walk, S.W.1. 5.30 p.m. W. H. Smith, W. G. Burton and J. C. Fidler: *Modern Trends in the Storage of Fruit and Vegetables*.
- SAT. 2 APR.** British Interplanetary Society, at Caxton Hall, Caxton Street, S.W.1. 6 p.m. H. Ziehl: *Problems of Heat Transfer in Rocket Motors*.

## OTHER ACTIVITIES

- MON. 21 MAR. UNTIL SUN. 27 MAR.** Imperial Institute, South Kensington, S.W.7. 12.30 p.m. 1.15 p.m. and 3 p.m. Weekdays, 3 p.m. and 4 p.m. Saturdays, 3 p.m., 4 p.m. and 5 p.m. Sundays. Films: *Splendid on Northern Rhodesia*; *Artic Hunters—Canada*.
- WED. 23 MAR.** Building Centre, 26 Store Street, W.C.1. 12.45 p.m. Film Show: *Housing the African in N. Rhodesia 1954*; *Power Station and Water Plant at Kuwait*.
- MON. 28 MAR. UNTIL SUN. 3 APR.** Imperial Institute, South Kensington, S.W.7. 12.30 p.m. 1.15 p.m. and 3 p.m. Weekdays, 3 p.m. and 4 p.m. Saturdays, 3 p.m., 4 p.m. and 5 p.m. Sundays. Films: *Indian Art Through the Ages*; *Fighting Fish—New Zealand*; *Durban Diary*.
- WED. 30 MAR.** Building Centre, 26 Store Street, W.C.1. 12.45 p.m. Film Show: *Bricks—How they are made and used*.
- NOW UNTIL 24 MAR.** Bund Deutscher Architekten, at the Royal Institute of British Architects, 66 Portland Place, W.1. Exhibition: *German Architecture To-day*.
- NOW UNTIL 28 MAR.** India, Pakistan and Ceylon Society, Royal, at the Imperial Institute, South Kensington, S.W.7. Exhibition: *Paintings of Flowers of India by Lady (Marie) Temple*.
- NOW UNTIL 7 APR.** Sanitary Institute, Royal, in the Museum of Hygiene, 90 Buckingham Palace Road, S.W.1. Exhibition: *You Versus Pests—Insects that Attack Food and Endanger Health*.
- NOW UNTIL 1 MAY.** Imperial Institute, South Kensington, S.W.7. Exhibition of *Loyal Addresses presented to Her Majesty during the Royal Tour 1953-54*.



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